A method of gathering information relating to consumption of broadcast content by receiving stations

Field of Invention

5 The present invention relates to a method of gathering information relating to consumption of broadcast content by receiving stations.

Background Art

Third generation (3G) multicasting may be used to deliver point-to-multipoint

10 content. For example, 3G multicasting may be used to provide services, such as news programs, to mobile stations.

Reference is made to 3rd Generation Partnership Project, Technical Specification Group Services and System Aspects, Multimedia Broadcast/Multicast Service, Stage

15 1, Release 5 (3GPP TS22.146 V5.1.0) which describes schemes for collecting charging information for using multicast services.

Charging information may be collected on the basis of duration of a multicast session, times of joining and leaving a multicast subscription group, duration of

20 membership of a multicast subscription group, times of joining and leaving a multicast group, duration of membership of a multicast group and volume of contents received during a multicast session.

In the examples just described, multicast joining and leaving messages may be used

25 for collecting charging information. These messages naturally lend themselves to being used in this way since they are employed in the normal course of establishing a multicast session.

The examples described above may also be used to determine ratings and to obtain

30 feedback during multicasting.

Other methods of determining audience ratings and obtaining feedback during multicasting are also known.

Case: PJP/42350PCT1

For example, a timer-based feed back mechanism for requesting periodic feedback of consumption of a multicast service is described in "Scalable feedback for large groups" by J. Nonnenmacher and E.W. Biersack, IEEE/ACM Transactions on Networking, pp. 375 – 386, Volume 7, Issue 3 (June 1999). A similar result is achieved using Scalable Reliable Multicast (SRM) protocol described in "A reliable multicast framework for light-weight sessions and application level framing" by S. Floyd, V. Jacobson, C. Liu, S. McCanne and L. Zhang, IEEE/ACM Transactions on Networking, volume 5, pp. 784 – 803 (December 1997). These methods can be used to start, maintain and stop transmission depending on the existence of the audience.

3G broadcasting and Internet protocol over terrestrial digital video broadcasting (IP over DVB-T) may also be used to deliver point-to-multipoint data.

However, broadcasting differs from multicasting in at least one respect, namely that transmission of content is initiated by a service provider or network and not by the user. Content is transmitted in broadcast cells according to a predefined schedule and users can opt either to receive or not to receive content. For example, a user may choose to receive a one program, but not another.

In broadcasting, it is desirable to generate ratings for programs for the purposes of billing users or charging advertisers. However, the methods of collecting charging information for using multicast services are not suited for use in broadcasting.

A satellite-based broadcasting system in which a broadcaster sends a Request for Feedback (RFB) to clients and the clients transmit feedback to a sever via a public land mobile network for determining size of audience is described in "Broadcast audience estimation" by Liu Chuanhai and J. Nonnenmacher, INFOCOM 2000, Proceedings of Nineteenth Annual Joint Conference of the IEEE Computer and Communications Societies, Volume 2, pp. 952 –960 (2000).

The present invention seeks to provide a method of gathering information relating to consumption of broadcasted content by receiving stations.

Summary of the Invention

5   According to a first aspect of the present invention there is provided a method of gathering information relating to consumption of broadcast content by receiving stations, the method comprising preparing a schedule for broadcasting content, including, in the schedule, an instruction to notify a given party of consumption of content and transmitting the schedule to a plurality of receiving stations.

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Transmitting the schedule to said plurality of receiving stations may comprise broadcasting the schedule to a plurality of receiving stations

According to a second aspect of the present invention there is provided a method

15   of gathering information relating to consumption of broadcast content, the method comprising preparing a description of the content, adding to the description an instruction to notify a given party of intended reception of the content and transmitting the description to a plurality of receiving stations.

20   Transmitting the description to said plurality of receiving stations may comprise broadcasting the description to a plurality of receiving stations

This has the advantage that consumption of content can be recorded in real time.

25   The method may comprise including in the schedule or adding to the description an instruction to notify the given party of intended continued reception of the content and/or an instruction to notify the given party of intended cessation of reception of content.

30   The method may comprise broadcasting the content if a receiving station notifies the given party that it intends to receive the content. The method may comprise receiving notifications from receiving stations. The method may comprise counting a number of receiving stations which notify the given party that they intend to

receive the content and/or counting a number of receiving stations which notify the given party that they are receiving the content.

The preparing of the description of the content may be according to the Session

5   Description Protocol.

The method may comprise identifying a region from which a notifications is received and broadcasting the content in the region. The method may comprise identifying a region from which no notification is received and not broadcasting the

10   content in the region.

According to a third aspect of the present invention there is provided a method, in a receiving station, of providing information relating to consumption of broadcast content, the method comprising receiving a schedule of broadcasting content,

15   determining whether the schedule includes an instruction to notify a given party of consumption of content and, if the schedule includes the instruction, then transmitting a notification to the given party.

According to a fourth aspect of the present invention there is provided a method, in

20   a receiving station, of providing information relating to consumption of broadcast content, the method comprising receiving a description of the content, determining whether an instruction has been added to the description, the instruction being to notify a given party of intended reception of the content and if the instruction is added to the description, then transmitting, to the given party, a notification of

25   intended reception of the content.

The method may comprise receiving the content. The method may further comprise transmitting, to the given party, a notification of intended continued reception of the content and/or transmitting, to the given party, a notification of

30   intended cessation of reception of the content.

According to a fifth aspect of the present invention there is provided a method of controlling a broadcasting network, said broadcasting network including a base

station for broadcasting content in a predetermined region, the method comprising determining whether a notification of intended reception of broadcast content is received from a receiving station located in said predetermined region and if, said notification is received, broadcasting the content in the predetermined region.

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The method may further comprising preparing a description of broadcast content adding to the description an instruction to notify a given party of intended reception of the content and transmitting the description to a plurality of receiving stations.

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According to a sixth aspect of the present invention there is provided a method of controlling a broadcasting network, the broadcasting network including a base station for broadcasting content in a predetermined region, the method comprising counting a number of notifications of intended reception of broadcast content

15 received from receiving stations located in said predetermined region and if, the number of notification equals or exceeds a predetermined number, broadcasting the content in the predetermined region.

The method may further comprise, if said number of notifications falls below said

20 predetermined number, stopping broadcast of said content in said predetermined region.

A notification of intended reception of broadcast content may be used as a notification of intended continued reception of broadcast content.

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According to a seventh aspect of the present invention there is provided apparatus for gathering information relating to consumption of broadcast content, the apparatus comprising means for preparing a description of the content, means for adding to the description an instruction to notify a given party of intended

30 reception of the content and means for transmitting the description to a plurality of receiving stations.

According to a eighth aspect of the present invention there is provided a apparatus for gathering information relating to consumption of broadcast content, the apparatus comprising a processor for preparing a description of the content and adding to the description an instruction to notify a given party of intended

5   reception of the content and a transmitter for transmitting the description to a plurality of receiving stations.

According to a ninth aspect of the present invention there is provided apparatus for controlling a broadcasting network, the broadcasting network including a content

10   provider, a network element for routing content and a base station for broadcasting content in a predetermined region, the apparatus comprising means for receiving, from receiving station, a notification of intended reception of broadcast content, means for determining whether the notification is received from a receiving station located in the predetermined region and means for instructing the network element

15   to route the content to the base station for transmission in the predetermined region.

According to a tenth aspect of the present invention there is provided apparatus for controlling a broadcasting network, the broadcasting network including a content

20   provider, a network element for routing content and a base station for broadcasting content in a predetermined region, the apparatus comprising a receiver for receiving, from receiving station, a notification of intended reception of broadcast content, a processor for determining whether the notification is received from a receiving station located in the predetermined region and transmitter for instructing

25   the network element to route the content to the base station for transmission in the predetermined region.

According to an eleventh aspect of the present invention there is provided a receiving station for providing information relating to consumption of broadcast

30   content, the receiving station comprising means for receiving a description of the content, means for determining whether an instruction has been added to the description, the instruction being to notify a given party of intended reception of

the content; and means for transmitting, to the given party, a notification of intended reception of the content if the instruction is added to the description.

According to a thirteenth aspect of the present invention there is provided a receiving station for providing information relating to consumption of broadcast content, the receiving station comprising a receiver for receiving a description of the content, a processor for determining whether an instruction has been added to the description, the instruction being to notify a given party of intended reception of the content and a transmitter for transmitting, to the given party, a notification of intended reception of the content if the instruction is added to the description.

According to a fourteenth aspect of the present invention there is provided a system for presenting program schedule data on a display of receiving station, said system comprising at least a schedule data for broadcasting content, the schedule data being organized to include at least partly an instruction to notify a given party of consumption of content.

The transmitting may be multicasting.

According to a fifteenth aspect of the present invention there is provided a computer program which, when executed by a data processing apparatus, causes said data processing apparatus to perform the method.

According to a sixteenth aspect of the present invention there is provided a computer program product storing the computer program.

According to a seventeenth aspect of the present invention there is provided a signal carrying the computer program.

According to an eighteenth aspect of the present invention there is provided a signal carrying a schedule or description of broadcast content which includes an instruction to notify a given party of consumption of content.

The signal may be electrical or optical. The signal may be a radio signal.

Brief Description of the Drawings

Embodiments of the present invention will now be described with reference to the
accompanying drawings in which:

Figure 1 is a schematic diagram of a system for transmitting content to a plurality of
mobile stations;

Figure 2 is a schematic diagram of a service delivery platform;

Figure 3 is a schematic diagram of a ratings centre;

Figure 4 is a schematic diagram of mobile station circuitry;

Figure 5 is a schematic diagram of mobile station functionality;

Figure 6 shows a service hierarchy;

Figure 7 shows a service program;

Figure 8 illustrates transmission of an electronic service guide;

Figure 9 is a schematic diagram of a session announcement;

Figure 10 illustrates a first process for providing content;

Figure 11 shows transmission of items during sessions;

Figure 12 is a process flow diagram of a method of operating a mobile station;

Figure 13 is a schematic diagram of a notification transmitted by a mobile station;

Figure 14 illustrates a second process for providing content;

Figure 15 is a process flow diagram of a method of operating a ratings centre;

Figure 16 is a process flow diagram of a method of operating a network element;

Figure 17 is a schematic diagram of another system for transmitting content to a
plurality of mobile stations;

Figure 18 is a schematic diagram of another mobile station; and

Figure 19 is a schematic diagram of another system for transmitting content to a
receiver.

Detailed Description of the Invention

System for delivering broadcast content

Referring to Figure 1, a system for delivering broadcast content is shown. The
broadcasting system includes at least one content provider 1_1, 1_2, 1_3, a service
delivery platform 2, a ratings centre 3, a core network 4, which includes at least one

network element 5_1, 5_2, and an access network 6. The access network 6 includes at least one network element 7_1, 7_2 and at least one wireless cell 8_1, 8_2 served by respective base stations 9_1, 9_2 and which can transmit signals to respective sets of receiving stations in the form of mobile stations 10_1, 10_2, 10_3, 10_4, 10_5, 10_6.

5

A broadcasting system can be considered to be different from a multicasting system in that a provider, not a consumer, initiates delivery of content. However, as will be explained in more detail later, the provider may initiate broadcasting in some areas but not others according to the number of the consumers present and wishing to

10   receive content in each area.

In this example, the core and access networks 4, 6 are included in a universal mobile telephone system (UMTS) for delivering broadcast content. In this example, aspects relating to the use of UMTS as a system for broadcasting are described.

15

The core network 4 is a packet-based network and the network elements 5_1, 5_2 are a gateway general packet radio service (GPRS) service node (GGSN) and a serving GPRS service node (SGSN) respectively.

20   The access network 6 is also a packet-based network and the network elements 7_1, 7_2 are radio network controllers (RNC). The base stations 9_1, 9_2 each comprise a base station node B for transmitting and receiving signals according to a wideband code division multiple access (WCDMA) specification.

25   *Service delivery platform 2*

Referring to Figure 2, functional elements of the service delivery platform 2 are shown. The service delivery platform 2 includes an electronic service guide (ESG) management module 11 for allowing an administrator (not shown) to control metadata for describing content, an ESG database 12 for storing metadata for the

30   ESG, a service discovery server 13 for generating and providing announcements of services and sessions, a content management module 14 for allowing the administrator to add, replace and delete content items for transmission, a contents

database 15 for storing or buffering content for transmission and a content server
16 for providing content.

Ratings centre 3

5   Referring to Figure 3, functional elements of the ratings centre 3 are shown. The
ratings centre 3 may include a ratings server 17, a database 18 and a management
module 19. The rating centre 3 may be integrated or collocated with the service
delivery platform 2. Alternatively, it may be integrated or collocated with a network
element 5_1, 5_2 or be located at a different site.

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Mobile station 10_1, 10_2, 10_3, 10_4, 10_5, 10_6

Referring to Figure 4, a mobile station 10_1, 10_2, 10_3, 10_4, 10_5, 10_6 is shown in more
detail. The mobile station 10_1, 10_2, 10_3, 10_4, 10_5, 10_6 includes an antenna 20, a radio
frequency section 21 for, *inter alia*, modulating/de-modualting and amplifying

15   signals, a signal processor 22 for, *inter alia*, coding/decoding signals, a microphone
23, a speaker 24, a controller 24, a user input 25, such as a keypad, a display 26,
memory 27, a smart card 28, such as a universal subscriber identification module
(USIM) 29, a smart card reader 30 and, optionally, storage 31, which may be non-
volatile memory. The mobile station 10_1, 10_2, 10_3, 10_4, 10_5, 10_6 is powered by a

20   battery (not shown).

Referring to Figure 5, functional elements of the mobile station 10_1, 10_2, 10_3, 10_4,
10_5, 10_6 are shown. The mobile station 10_1, 10_2, 10_3, 10_4, 10_5, 10_6 includes a receiver
32, a service discovery client 33, an ESG database 34 for storing the ESG, an ESG

25   browser 35, content filtering application 36, a content database 37 for storing
content and a content browser 38.

The receiver 34 receives, demodulates and decapsulates data received from the
access network 6. The demodulated and decapsulated data is forwarded to an IP

30   stack (not shown). The demodulated and decapsulated data comprises IP packets
carrying content streams or metadata describing content. The IP packets are
forwarded to IP-based applications, such as the service discovery client 33 or

content filtering application 36, running on the mobile station 10_1, 10_2, 10_3, 10_4, 10_5, 10_6.

5   The service discovery client 33 receives IP packets carrying the ESG. The IP packets carry metadata which can be stored in the ESG database 34 or forwarded directly to the ESG browser 35.

The ESG database 34 may be held in memory 28 or storage 31 (Figure 4). When the mobile station 10_1, 10_2, 10_3, 10_4, 10_5, 10_6 is first switched on, the ESG database
10   34 is usually empty. However, the ESG database 34 fills up and is updated as the ESG is received.

The ESG browser 35 allows a user to view schedules and descriptions of services, sessions and content items available from the service delivery platform 2 (Figure 1).
15   The ESG browser 35 can retrieve metadata from the ESG database 34 or receive updates directly from the service discovery client 33.

The content filtering application 36 receives IP packets on one or more given addresses and one or more given ports configured by the content browser 38 or
20   other applications running. The IP packets carry content which can be stored in the content database 37 or forwarded directly to the content browser 38.

The content browser 38 is usually loaded and run when the user selects selected a particular content item for consumption. The content item can be received in real
25   time or retrieved from the content database 37. The content browser 38 can be for example a Web browser, an MP3 player or a streaming video client.

Electronic Service Guide (ESG)
An ESG is used to inform users about services which are available. The services are
30   arranged according to a hierarchy to help users find services in which he or she may be interested. Each service may comprise one or more sessions which include at least one item. An item may include text, audio, video file or other data types. An item may also comprise two or more types of data, such as a video and audio. The

- 12 -

ESG includes information about the hierarchy of services and information about items transmitted during a session.

5   Referring to Figure 6, a hierarchy 39 of available services is shown. The hierarchy 39 includes categories 40_1, 40_2. Examples of first and second categories 40_1, 40_2 are news and sports respectively. Categories 40_1, 40_2 may in turn be divided into sub-categories (not shown). Categories 40_1 may include at least one service set 41_1 which may include at least one service 42_1.

10   A service set 41_1 groups together services 42_1 of same or similar type, usually provided or owned by one service provider or content provider. The service provider or content provider may provide or own a plurality of service sets 41_1. A service 42_1 may be included in a plurality of service sets 41_1. In this example, the first category 40_1 includes a service set 41_1 labelled "CNN News Watch" which 15   includes a service 42_1 called "Live Update".

Referring to Figure 7, the ESG browser 35 (Figure 5) can be used to display a schedule 43 and to examine in detail a service 42_1. The service 42_1 may include at least one session 44_1, 44_2 which may include at least one item 45_1, 45_2, 45_3. For 20   example, the "Live Update" service 42_1 provided by "CNN News Watch" service set 34_1 may include a session or program 44_1 labelled "Business News" which includes items 45_1, 45_2, 45_3 relating to business news in US, Europe and Asia respectively. The session 44_1 is scheduled to begin and end at given times. Items 45_1, 45_2, 45_3 may also be scheduled.

25

The hierarchy 39 of categories 40_1, service sets 41_1 and services 42_1 usually does not change on a daily or weekly basis. However, sessions 44_1, 44_2 and items 45_1, 45_2, 45_3 may change on a daily basis.

30   *Hierarchy and session announcements*
Referring to Figure 8, the ESG includes two types of announcements, namely hierarchy announcements 46_1, 46_2, 46_N and session announcements 47_1, 47_2, 47_M. Each set of announcements 46_1, 46_2, 46_N is transmitted using a carousel (not

shown). In other words, announcements 46_1, 46_2, 46_N are transmitted one after another. When all the announcements 46_1, 46_2, 46_N have been sent, the carousel starts to send the announcements again 46_1, 46_2, 46_N. In this example, the service discovery server 13 (Figure 2) provides one carousel for each type of

5   announcement. It may also provide additional carousels (not shown) for main pages and alerts.

A mobile station 10_1, 10_2, 10_3, 10_4, 10_5, 10_6 listens to announcements 46_1, 46_2, 46_N, 47_1, 47_2, 47_M so as to acquire the ESG.

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Announcements 46_1, 46_2, 46_N, 47_1, 47_2, 47_M are transmitted through the core network 4 and access network 6 over an IP control channel (IP-CC).

When a mobile station 10_1, 10_2, 10_3, 10_4, 10_5, 10_6 is switched on, it usually does not

15   have any ESG information. Therefore, the mobile station 10_1, 10_2, 10_3, 10_4, 10_5, 10_6 starts ESG discovery.

ESG discovery includes obtaining an IP address for receiving hierarchy announcements 46_1, 46_2, 46_N. Usually, the IP address is obtained by listening to a

20   default IP address. Once a mobile station 10_1, 10_2, 10_3, 10_4, 10_5, 10_6 knows the address on which the hierarchy announcements 46_1, 46_2, 46_N are transmitted, it listens for hierarchy announcements 46_1, 46_2, 46_N.

The hierarchy announcements 46_1, 46_2, 46_N provide a hierarchy file (not shown)

25   describing the hierarchy 39 (Figure 6). The hierarchy file may take the form of an XML file.

The hierarchy announcements 46_1, 46_2, 46_N also provide an IP address for receiving session announcements 47_1, 47_2, 47_M. Once a mobile station 10_1, 10_2, 10_3, 10_4, 10_5,

30   10_6 knows the address on which the session announcements 47_1, 47_2, 47_N are transmitted, it listens for session announcements 47_1, 47_2, 47_N.

Optionally, the process may include receiving main page and alert announcements (not shown) and announcements (not shown) for providing more details of services, sessions and items.

5   Referring to Figure 9, a session announcement 47_1, 47_2, 47_M is shown in more detail. Each session announcement 47_1, 47_2, 47_M includes a header 48 and a description 49 of a respective session 44_1 and items 45_1, 45_2, 45_M included in the session 44_1.

In this example, Session Announcement Protocol (SAP) is used to transmit session
10   announcements 47_1, 47_2, 47_M and Session Description Protocol (SDP) is used to describe the session 44_1 and session items 45_1, 45_2, 45_M. Reference is made to "Session Announcement Protocol" by M. P. Maher, C. Perkins & E. Whelan, RFC 2974, IETF, October 2000 and to "Session Description Protocol" by M. Handley & V. Jacobson, RFC 2327, IETF, April 1998.

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The description 49 may include a session identifier (session ID) for uniquely identifying the session, a session name, a category identifier (category ID) for identifying the, or each, category to which the session belongs, a service identifier (service ID) for identifying the, or each, service to which the session belongs, start
20   and stop times for scheduling the session, a session description, a universal resource locator (URL) for a more detailed description, a URL for purchasing, a protection identifier (protection ID), a maximum bit rate of the session, data for identifying a MIME type from which it possible to identify a target application and/or a priority value for resolving filtering and Quality of Service (QoS) problems. The description
25   49 may also include additional arguments or fields for applications such as information for parental rating and genre classification.

The description 49 may also include at least one IP address and at least one port number for receiving service items.

30

The description 49 may also include information on the, or each item, such as a URL for more detailed information for respective items, an item identifier (item ID) for uniquely identifying an item, start and stop times for scheduling the item, a

description of the item, a URL for voting and a maximum bit rate for the item. The description 42 may also include additional arguments, such as information for parental rating and classifying the item type.

5   A list of field types is found in "Session Announcement Protocol" *ibid.*

As will now be described in more detail, a schedule provided by an ESG and broadcast to end-users includes a request or instruction to end-users to provide feedback. Resulting feedback from end-users can be used to determine audience

10   ratings. Furthermore, the feedback can also be used to select areas in which to broadcast content. For example, if no feedback is received in a particular area, then content need not be broadcast in that area.

Instruction to send notification

15   A message, hereinafter referred to as an instruction, is included in the description 49 for instructing a mobile station 10_1, 10_2, 10_3, 10_4, 10_5, 10_6 to transmit a notification if the mobile station 10_1, 10_2, 10_3, 10_4, 10_5, 10_6 wishes to receive the session, to transmit a notification if the mobile station 10_1, 10_2, 10_3, 10_4, 10_5, 10_6 wishes to continue receiving the session and/or to transmit a notification if the

20   mobile station 10_1, 10_2, 10_3, 10_4, 10_5, 10_6 wishes to cease receiving a session. Separate instructions may be used. The instruction may also specify a time interval between which notifications should be transmitted.

In this example, an SDP category field is used and the instruction takes the form:

25

```
a=X-monitoringFlag:<value><time>
```

where <value> = 1 if the mobile station 10_1, 10_2, 10_3, 10_4, 10_5, 10_6 is instructed to transmit notifications and <time> is time interval the mobile station 10_1, 10_2, 10_3,

30   10_4, 10_5, 10_6 should wait between transmitting notifications.

The instruction may also include information for identifying to whom the notification should be transmitted. For example, this may be a URL and so the instruction may take the form:

```
a=X-monitoringFlag:<value><time>
a=X-monitoringFlagURL:<url>
```

In this case, the URL is that of the ratings server 17 (Figure 3). Other labels may be used instead of "monitoringFlag".

Further instructions may be included in the description 49 for instructing the mobile station 10_1, 10_2, 10_3, 10_4, 10_5, 10_6 to transmit a notification if the mobile station 10_1, 10_2, 10_3, 10_4, 10_5, 10_6 wishes to receive an item, to transmit a notification if the mobile station 10_1, 10_2, 10_3, 10_4, 10_5, 10_6 wishes to continue receiving an item and/or to transmit a notification if the mobile station 10_1, 10_2, 10_3, 10_4, 10_5, 10_6 wishes to cease receiving an item. The, or each, further instruction may also specify a time interval between which notifications should be transmitted.

Thus, for each item, a further instruction may take the form:

```
a=X-itemId:<item_id>
a=X-monitoringFlag:<value><time>
a=X-monitoringFlagURL:<url>
```

The mobile station 10_1, 10_2, 10_3, 10_4, 10_5, 10_6 is provided with a routine for interpreting the instruction and any further instructions included in the description 49.

For example, a routine may include:

```
IF monitoringFlag=1
        startransmissionFlag=1
        continuetransmissionFlag=1
        timeinterval=time
        finishtransmissionFlag=1
```

end

If the mobile station 10_1, 10_2, 10_3, 10_4, 10_5, 10_6 wants to receive content or continue receiving content, then a flag "receivecontentFlag" may be set.

5

Thus, the routine may also include:

```
IF receivecontentFlag=1 and startransmissionFlag=1
     send message "Start receiving content"
end
```

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```
IF receivecontentFlag=1 and finishtransmissionFlag =1
     send message "Finish receiving content"
end
```

15

```
IF receivecontentFlag=1 and scontinuetransmissionFlag=1
     send message "Continue receiving content"
end
```

20   Thus, the message is used to instruct or request mobile stations 10_1, 10_2, 10_3, 10_4, 10_5, 10_6 to provide feedback. The resulting feedback can be used to generate audience ratings and/or to select areas in which to broadcast content, as will now be described in more detail:

25   *Method of generating ratings*
Referring to Figure 10, a method of generating ratings is shown.

The service delivery platform 2 prepares an ESG. This includes preparing session announcements including descriptions of sessions. The service delivery platform 2
30   checks whether each session is to be rated, and if so, includes an instruction for instructing a mobile station 10_1, 10_2, 10_3, 10_4, 10_5, 10_6 to transmit respective notifications if the mobile station 10_1, 10_2, 10_3, 10_4, 10_5, 10_6 wishes to receive the session, to continue receiving the session and to cease receiving the session.

In this case, an instruction is to be included in each of the descriptions for the first and second sessions 44_1, 44_2. Each description takes the form of an SDP description and the instruction takes the form of an SDP category field as described earlier.

5

The service delivery platform 2 transmits the ESG (step S1).

The ESG is broadcast to mobile stations 10_1, 10_2, 10_3, 10_4, 10_5, 10_6 in cells 8_1, 8_2. Taking the first mobile station 10_1 as an example, the first mobile station 10_1

10   receives the ESG and for each session and, optionally, for each item in each session, checks whether there is an instruction to transmit a notification.

In this example, the ESG is included in the hierarchy and session announcements 46_1, 46_2, 46_M, 47_1, 47_2, 47_M (Figure 8). The first and second session announcements

15   47_1, 47_2 include descriptions of first and second sessions 44_1, 44_2 respectively (Figure 7). The mobile station 10_1 examines the description 49 included in the session announcements 47_1, 47_2 and checks whether there is an instruction to notify the ratings centre 3. In other words, it checks whether the "a=x-monitoringFlag" is present. It also checks whether there are any another similar

20   fields with additional instructions.

The service delivery platform 2 also transmits a message to the SGSN 5_2 requesting that the SGSN 5_2 reserve bandwidth for transmitting content (step S2). The SGSN 5_2 reserves the bandwidth and returns an acknowledgement to the service delivery

25   platform 2 (step S3). The service delivery platform 2, if it has not done so already, sends a message to the, or each content provider 1_1, 1_2, 1_3, instructing them to transmit content (step S4).

The service delivery platform 2 transmits content (step S5).

30

Referring also to Figure 11, content 50 includes content 51_1, 51_2, 51_3 for each item 45_1, 45_2, 45_3 (Figure 7) included in the first session 44_1 (Figure 7) and content 52_1, 53_1, 53_2, 54_1, 54_2, 55_1 for other items included in other sessions (not shown) some of

which may or may not be transmitted simultaneously. Content for each item comprises IP packets. For example, content 51_1 for the first item 45_1 (Figure 7) comprises a plurality of IP packets 56_{1A}, 56_{1B}, 56_{1C}. Content 51_2 for the second item 45_2 (Figure 7) comprises a plurality of IP packets 56_{2A}, 56_{2B}, 56_{2C} and content 51_3 for
5   the second item 45_3 (Figure 7) comprises a plurality of IP packets 56_{3A}, 56_{3B}, 56_{3C}.

Content 50 is transmitted via the service delivery platform 2, through the core network 4 (Figure 1), to the access network 6 (Figure 1) which broadcasts the IP packets 56_{1A}, 56_{1B}, 56_{1C}, 56_{2A}, 56_{2B}, 56_{2C}, 56_{3A}, 56_{3B}, 56_{3C} in cells 8_1, 8_2 using base
10   stations 9_1, 9_2 (step S5). Until the mobile station 10_1 is instructed to do so by its user, the mobile station 10_1 does not receive, filters out or ignores IP packets 56_{1A}, 56_{1B}, 56_{1C}, 56_{2A}, 56_{2B}, 56_{2C}, 56_{3A}, 56_{3B}, 56_{3C} carrying content 51_1, 51_2, 51_3 relating to the session 44_1.

15   The mobile station 10_1, 10_2, 10_3, 10_4, 10_5, 10_6 transmits a notification that it wishes to start consuming content in respect of which it has been instructed to send a notification (step S6). In this example, this is done as follows:

The user, via the ESG browser 35 (Figure 5), indicates that he or she wishes to
20   watch the Business News, in other words consume items 45_1, 45_2, 45_3 included in the first session 44_1. The mobile station 10_1 transmits a notification 57 (Figure 13) to the ratings centre 3 notifying the ratings centre 3 that it is beginning to consume items 45_1, 45_2, 45_3 included in the first session 44_1 (Figure 7) (steps S6).

25   Referring to Figure 12, a notification 57 is in the form of a user datagram protocol (UDP) packet and includes a header 58 and payload 59 which includes data for identifying the first session 44_1 and data for identifying whether consumption is beginning, continuing or ending.

30   Referring again to Figures 10 and 11, the mobile station 10_1, 10_2, 10_3, 10_4, 10_5, 10_6 starts to receive content in respect of which it has been instructed to send a notification (step S7).

In this example, the mobile station 10_1 begins to receive and parse IP packets 56_{1A}, 56_{1B}, 56_{1C}, 56_{2A}, 56_{2B}, 56_{2C}, 56_{3A}, 56_{3B}, 56_{3C} carrying content relating to items 45_1, 45_2, 45_3 in the first sessions 44_1 to content database 37 (Figure 5) for storing and/or to content browser 38 (Figure 5) for immediate presentation to the user.

5

The mobile station 10_1, 10_2, 10_3, 10_4, 10_5, 10_6 transmits a notification that it is continuing to consume the content (step S8).

In this case, while the mobile station 10_1 receives and parses IP packets 56_{1A}, 56_{1B},

10   56_{1C}, 56_{2A}, 56_{2B}, 56_{2C}, 56_{3A}, 56_{3B}, 56_{3C} carrying content relating to items 45_1, 45_2, 45_3 (Figure 7) in the first sessions 44_1 (Figure 7), it periodically send a notification 57 (Figure 13) to the ratings centre 3 informing the ratings centre 3 that it is still consuming items 45_1, 45_2, 45_3.

15   The mobile station 10_1, 10_2, 10_3, 10_4, 10_5, 10_6 transmits a notification that it is finished consuming content (step S9). In this example, this is done as follows:

The user indicates that he or she no longer wishes to watch the Business News. This may be down my entering a command through the content browser 38 (Figure

20   5).

The mobile terminal 10_1 ceases to receive and parse the IP packets 56_{1A}, 56_{1B}, 56_{1C}, 56_{2A}, 56_{2B}, 56_{2C}, 56_{3A}, 56_{3B}, 56_{3C} and so it sends a notification 57 (Figure 13) to the ratings centre 3 that it is has finished consuming items 45_1, 45_2, 45_3 (Figure 7).

25

It will be understood, that more than one mobile station 10_1, 10_2, 10_3, 10_4, 10_5, 10_6 may want to receive items 45_1, 45_2, 45_3 (Figure 7) included in the first session 44_1 (Figure 7) and so more than one sets of notifications 57 (Figure 13) may be sent to the ratings centre 3.

30

The process hereinbefore described may be used to charge each mobile station 10_1, 10_2, 10_3, 10_4, 10_5, 10_6 for accessing a service.

The process may be used to generate ratings. The ratings centre 3 collects notifications 57 (Figure 13) relating to the same session or item, such as the first session 44_1 (Figure 7), and counts the notifications 57. In this way, the ratings centre 3 can determine how many mobile stations 10_1, 10_2, 10_3, 10_4, 10_5, 10_6

5   consumed the session 44_1 (Figure 7). If advertisements are displayed or played during the session 44_1 (Figure 7) or item 45_1, 45_2, 45_3 (Figure 7), then, using the ratings, a corresponding charge may be calculated.

The process has the advantage that ratings can be generated in real time.

10

Method of operating the mobile station 10_1, 10_2, 10_3, 10_4, 10_5, 10_6

Referring to Figure 13, a method of operating the mobile station 10_1, 10_2, 10_3, 10_4, 10_5, 10_6 is shown.

15   The mobile station 10_1, 10_2, 10_3, 10_4, 10_5, 10_6 receives the ESG (step M1).

In this case, the ESG is included in hierarchy and session announcements 46_1, 46_2, 46_M, 47_1, 47_2, 47_M (Figure 8). The first and second session announcements 47_1, 47_2 (Figure 8) include descriptions of the first and second sessions 44_1, 44_2 (Figure 7).

20

For each session and, optionally, for each item in each session, the mobile station 10_1, 10_2, 10_3, 10_4, 10_5, 10_6 checks whether there is an instruction to transmit a notification (step M2).

25   In this example, the mobile station 10_1, 10_2, 10_3, 10_4, 10_5, 10_6 examines the description 48 included in the session announcements 47_1, 47_2 and checks whether there is an instruction to notify the ratings centre 3. In other words, it checks whether the "a=X-monitoringFlag" is set. It also checks whether there are any another similar fields with additional instructions.

30

The mobile station 10_1, 10_2, 10_3, 10_4, 10_5, 10_6 determines whether it is to participate in a session (step M3) and, if instructed to send a notification, transmits a notification (step M4).

In this example, the user, via the ESG browser 35 (Figure 5), indicates that he or she wishes to watch the Business News, in other words consume items 45_1, 45_2, 45_3 included in the first session 44_1. The mobile station 10_1, 10_2, 10_3, 10_4, 10_5, 10_6

5 checks whether it has been instructed to send a notification and since "a=x-monitoringFlag" is set, transmits the notification 57 (Figure 12) to the ratings server 3.

The mobile station 10_1, 10_2, 10_3, 10_4, 10_5, 10_6 begins to receive content in respect of

10 which it has sent a notification (step M5).

In this instance, the mobile station 10_1, 10_2, 10_3, 10_4, 10_5, 10_6 begins to receive and parse IP packets 56_{1A}, 56_{1B}, 56_{1C}, 56_{2A}, 56_{2B}, 56_{2C}, 56_{3A}, 56_{3B}, 56_{3C} (Figure 11) carrying content relating to items 45_1, 45_2, 45_3 (Figure 7) in the first session 44_1 (Figure 7) to

15 the content database 37 (Figure 2) for storing and/or to content browser 38 (Figure 2) for immediate presentation to the user.

The mobile station 10_1, 10_2, 10_3, 10_4, 10_5, 10_6 checks whether it is still consuming content in respect of which it has sent a notification (step M6). If so, it sends a

20 notification that it is still consuming content (step M7). If not, it sends a notification that it will cease or has ceased consuming content (step M8).

For example, while the mobile station 10_1, 10_2, 10_3, 10_4, 10_5, 10_6 receives and parses IP packets 56_{1A}, 56_{1B}, 56_{1C}, 56_{2A}, 56_{2B}, 56_{2C}, 56_{3A}, 56_{3B}, 56_{3C} (Figure 11), it

25 periodically sends a notification 57 (Figure 13) to the ratings centre 3 informing the ratings centre 3 that it is still consuming items 45_1, 45_2, 45_3 (Figure 7) included in the first session 44_1.

When the mobile terminal 10_1, 10_2, 10_3, 10_4, 10_5, 10_6 ceases to receive and parse the

30 IP packets 56_{1A}, 56_{1B}, 56_{1C}, 56_{2A}, 56_{2B}, 56_{2C}, 56_{3A}, 56_{3B}, 56_{3C}, it sends a notification 57 (Figure 13) to the ratings centre 3 that it is has finished consuming items 45_1, 45_2, 45_3 (Figure 7).

Method of controlling broadcasting

Notifications 57 (Figure 13) may also be used to control in which regions or areas content is broadcasted. Thus, content may be broadcasted in regions in which mobile stations 10_1, 10_2, 10_3, 10_4, 10_5, 10_6 wish to consume the content.

5

Referring to Figure 14, a method of controlling broadcasting is shown.

An ESG is prepared and the service delivery platform 2 and SGSN 5_2 perform steps S1 to S4 as described earlier (steps S10 to S13).

10

Content 50 (Figure 11) is transmitted to a network element, in this case the SGSN 5_2, where it is stored (step S14). It is not automatically forwarded to the base stations 9_1, 9_2 for transmission to the mobile stations 10_1, 10_2, 10_3, 10_4, 10_5, 10_6.

15   A user, via the ESG browser 35 (Figure 5), indicates that he or she wishes to watch the Business News, in other words consume items 45_1, 45_2, 45_3 included in the first session 44_1.

The mobile station 10_1, 10_2, 10_3, 10_4, 10_5, 10_6 transmits a notification that it wishes
20   to start consuming content in respect of which it has been instructed to send a notification (step S15).

In this example, the mobile station 10_1 transmits a notification 57 (Figure 13) to the ratings centre 3 that it is beginning to consume items 45_1, 45_2, 45_3 included in the
25   first session 44_1 as described earlier.

The ratings centre 3 transmits an instruction to the network element to forward content provided a minimum number of mobile stations 10_1, 10_2, 10_3, 10_4, 10_5, 10_6 send notifications (step S16).

30

The ratings centre 3 listens for notifications 57. Notifications 57 are grouped according to sessions and/or items and also according to cells 8_1, 8_2 and are counted. If a counted number of mobile stations wishing to consume the same

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session or item in the same cell 8_1, 8_2 equals or exceeds a predetermined minimum number, which is usually set to one, then the ratings centre 3 transmits an instruction to the SGSN 5_2 to transmit corresponding content 50 in the cell 8_1, 8_2 (step R3). Thus, in this example, if a notification 57 is received from the mobile

5   station 10_1 located in the first cell 8_1 indicating that it wishes to consume items included in the first session 44_1, then an instruction is sent to the SGSN 5_2 to transmit IP packets 56_{1A}, 56_{1B}, 56_{1C}, 56_{2A}, 56_{2B}, 56_{2C}, 56_{3A}, 56_{3B}, 56_{3C} in the first cell 8_1.

10   The SGSN 5_2 receives the instruction from the ratings centre 3 and forwards the corresponding content 50 to the corresponding base stations 9_1, 9_2 for broadcasting in corresponding cell 8_1, 8_2. In this example, the SGSN 5_2 forwards IP packets 56_{1A}, 56_{1B}, 56_{1C}, 56_{2A}, 56_{2B}, 56_{2C}, 56_{3A}, 56_{3B}, 56_{3C} to the first base station 9_1 for broadcasting in the first cell 8_1.

15

Mobile stations may then receive the corresponding content 50 broadcast in their cell 8_1, 8_2. For example, the mobile station 10_1 begins to receive and parse IP packets 56_{1A}, 56_{1B}, 56_{1C}, 56_{2A}, 56_{2B}, 56_{2C}, 56_{3A}, 56_{3B}, 56_{3C} carrying content relating to items 45_1, 45_2, 45_3 in the first sessions 44_1 to content database 37 (Figure 5) for

20   storing and/or to content browser 38 (Figure 5) for immediate presentation to the user.

The mobile station 10_1, 10_2, 10_3, 10_4, 10_5, 10_6 transmits a notification that it is continuing to consume the content (step S17).

25

In this example, while the mobile station 10_1 receives and parses IP packets 56_{1A}, 56_{1B}, 56_{1C}, 56_{2A}, 56_{2B}, 56_{2C}, 56_{3A}, 56_{3B}, 56_{3C}, it periodically send a notification 57 (Figure 13) to the ratings centre 3 informing the ratings centre 3 that it is still consuming items 45_1, 45_2, 45_3.

30

The mobile station 10_1, 10_2, 10_3, 10_4, 10_5, 10_6 transmits a notification that it is finished consuming content (step S18). The ratings centre 3 transmits an instruction to the network element to cease transmitting content if the number of

mobile stations 10_1, 10_2, 10_3, 10_4, 10_5, 10_6 is below the minimum number (step S19). Thus, content ceases to be transmitted in the cell (step S20). In this example, this happens as follows:

5   If the ratings centre 3 receives further notifications 57 and determines that the counted number of mobile stations in the same cell wishing to receive or continue receiving a session still exceeds the minimum number, then it allows the broadcast to continue. However, if the counted number falls below the minimum number then it transmits an instruction to the SGSN 5_2 to stop transmitting content 50 in
10   the corresponding cell 8_1, 8_2

     If the SGSN 5_2 receives the instruction from the ratings centre 3 to cease transmitting some of the content 50 in a particular cell 8_1, 8_2, then it stops forwarding the corresponding content 50 to the corresponding base station 9_1, 9_2 or,
15   if the content has already been forwarded, transmits an instruction to the corresponding base station 9_1, 9_2 not to broadcast the corresponding content 50.

     In this case, the ratings centre 3 periodically receives notifications 57 from the mobile station 10_1 that the mobile station 10_1 is still consuming items 45_1, 45_2, 45_3
20   (Figure 7).

     The user indicates that he or she no longer wishes to watch the Business News.

     The mobile terminal 10_1 sends a notification 57 (Figure 13) to the ratings centre 3
25   that it is has finished consuming items 45_1, 45_2, 45_3. The ratings centre 3 transmits an instruction to the SGSN 5_2 to stop transmitting corresponding content 50 and the SGSN 5_2 stops forwarding any unsent IP packets 56_{1A}, 56_{1B}, 56_{1C}, 56_{2A}, 56_{2B}, 56_{2C}, 56_{3A}, 56_{3B}, 56_{3C} to the first base station 9_1.

30   The process may be used to broadcast content 50 as and when required. For example, the first session may be broadcast in the first cell 8_1, but not the second cell 8_2.

Thus, mobile stations 10_1, 10_2, 10_3, 10_4, 10_5, 10_6 provide feedback as to whether they wish to receive content. Consequently, transmission of the broadcast content may be switched on and off in different regions according to whether end-users have shown interest in receiving the content. This has the advantage of freeing network resources.

Method of operating a ratings centre 3

Referring to Figure 15, a method of operating the ratings centre 3 for controlling broadcasting is shown.

The ratings centre 3 listens for notifications 57 (step R1) and determines whether it has received enough notifications in respect of the same session or item in a given region (step R2).

In this case, the ratings centre 3 groups notifications 57 (Figure 12) according to session, and/or item, and according to cell 8_1, 8_2. It counts a number of mobile stations 10_1, 10_2, 10_3, 10_4, 10_5, 10_6 sending notifications 57 (Figure 12) in respect of each session (or item) in each cell 8_1, 8_2. The number is compared to a predetermined threshold, which is usually one.

If the ratings centre 3 determines that it has received enough notifications in respect of the same session or item, then it instructs the network element 52 to forward content for the session for transmission in the given area (step R3).

In this case, the ratings centre 3 receives a notification 57 (Figure 12) from the first mobile 10_1 that it wishes to consume items 45_1, 45_2, 45_3 included in the first session 44_1. The predetermined threshold is one. Therefore, the ratings centre 3 transmits an instruction to the SGSN 5_2 to transmit IP packets 56_{1A}, 56_{1B}, 56_{1C}, 56_{2A}, 56_{2B}, 56_{2C}, 56_{3A}, 56_{3B}, 56_{3C} in the first cell 8_1.

The ratings centre 3 listens for notifications in respect of the session or item (step R4).

If the ratings centre 3 determines that it still receives enough notifications in respect of the same session or item, then allows the network element 5_2 to forward content for the session for transmission in the given area, otherwise it instructs the network element 5_2 to cease forwarding the content (step R5).

5

Method of operating a network element 5_2

Referring to Figure 16, a method of operating a network element 5_2 for controlling broadcasting is shown.

10   The network element 5_2 listens for content from the service delivery platform 2 (step N1). If the network element 5_2 receives content, then it stores the content 50 in storage (not shown) (steps N2 & N3).

In this example, the network element 5_2 is the SGSN 5_2 and the content 50 includes
15   content 51_1, 51_2, 51_3 for each item 45_1, 45_2, 45_3 (Figure 7) included in the first session 44_1 (Figure 7). The content 51_1, 51_2, 51_3 is included in IP packets 56_{1A}, 56_{1B}, 56_{1C}, 56_{2A}, 56_{2B}, 56_{2C}, 56_{3A}, 56_{3B}, 56_{3C}. The content 51_1, 51_2, 51_3 may accompanied with instructions as to how long to store the data.

20   The network element 5_2 then listens for instructions from the service delivery platform 2 (step N4).

The network element 5_2 determines whether an instruction to begin transmitting content is received (step N5).

25

If no instructions are received, then network element 5_2 checks whether the period for transmitting the content has expired (step N6). If so, the network element 5_2 clears the content from storage (not shown) (step N7) and begins listening once more for content. Otherwise, the network element 5_2 continues to listens for
30   instructions.

If instructions are received, then the network element 5_2 takes content from storage (not shown) and forwards it for transmission (steps N8). The instructions include details of the intended destination of the content.

5   For example, the SGSN 5_2 receives an instruction from the ratings centre 3 to forward content 51_1, 51_2, 51_3 for each item 45_1, 45_2, 45_3 (Figure 7) included in the first session 44_1 (Figure 7) to the first cell 8_1. The SGSN 5_2 begins to forward the IP packets 56_{1A}, 56_{1B}, 56_{1C}, 56_{2A}, 56_{2B}, 56_{2C}, 56_{3A}, 56_{3B}, 56_{3C} to the first base station 9_1 for broadcasting in the first cell 8_1.

10

The network element 5_2 determines whether there is content left to forward (step N9).

   · If there is no content left to forward, then it listens once more for content If there
15   is content left, then it listens for further instructions from the service delivery
   . platform 2 (step N10).

The network element 5_2 determines whether an instruction is received to stop transmitting content is received (step N11).

20

If no instruction is received, then the network element 5_2 continues to fetch content from storage (not shown) and forward it for transmission.

However, if an instruction is received to stop transmission, then transmission is
25   suspended and the network element 5_2 listens for instructions to restart transmitting remaining content.

DVB-T & UMTS system
Referring to Figure 17, another system for delivering content and returning
30   feedback is shown. The system includes at least one content provider 1_1, 1_2, 1_3, a service delivery platform 2 and a ratings centre 3.

The system includes a first core network 4_A, which includes at least one network element 5_{A1}, 5_{A2}, and a first access network 6_A. The first access network 6_A may include network elements 7_{A1}, 7_{A2} and include at least one wireless cell 8_{A1}, 8_{A2} served by respective base stations 9_{A1}, 9_{A2}.

5

The system includes a second core network 4_B, which includes at least one network element 5_{B1}, 5_{B2}, and a first access network 6_B. The second access network 6_B may include network elements 7_{B1}, 7_{B2} and include at least one wireless cell 8_{B1}, 8_{B2} served by respective base stations 9_{B1}, 9_{B2}.

10

First base stations 9_{A1}, 9_{B1} of the access networks 6_A, 6_B serve a first set of terminals in the form of dual-network mobile stations $10_1'$, $10_2'$, $10_3'$. Second base stations 9_{A2}, 9_{B2} of the access networks 6_A, 6_B serve a second set of terminals in the form of dual-network mobile stations $10_4'$, $10_5'$, $10_6'$.

15

In this example, the first network 4_A, 6_A is or forms part of a terrestrial Digital Video Broadcasting (DVB-T) network.

The first core network 4_A is a packet-based network and the network elements 5_{A1}, 20 5_{A2} may be routers.

The first access network 6_A is also a packet-based network and the network elements 7_{B1}, 7_{B1} may each be a multiprotocol encapsulator (MPE) or an IP encapsulator (IPE). The base stations 9_{A1}, 9_{A2} may each comprise DVB-T 25 transmitter for transmitting orthogonal frequency divisional multiplexing (OFDM) signals.

In this example the second network 4_B, 6_B is or forms part of a universal mobile telephone system (UMTS) network. In this example, the UMTS is not used for 30 broadcasting but rather for point-to-point communication with the ratings server 17 (Figure 3).

The second core network 4_B is a packet-based network and the network elements 5_{B1}, 5_{B2} may be a gateway general packet radio service (GPRS) service node (GGSN) and a serving GPRS service node (SGSN) respectively.

5   The second access network 6_B is also a packet-based network and the network elements 7_{B1}, 7_{B2} may be radio network controllers (RNC). The base stations 9_{B1}, 9_2 may each comprise a base station node B for transmitting according to a wideband code division multiple access (WCDMA) specification.

10   The second network 4_B, 6_B may be a public land mobile network (PLMN) network, such as a GSM network, a wired network, such as a public switched telephone network (PSTN) or cable network, or the Internet.

     The first network 4_A, 6_A is used to transmit the ESG, including a request for
15   feedback, and content to the mobile stations 10_1', 10_2', 10_3', 10_4', 10_5', 10_6' according to any of the methods described earlier. The second network 4_B, 6_B is used to provide feedback from the mobile stations 10_1', 10_2', 10_3', 10_4', 10_5', 10_6' to the ratings server 17 (Figure 3) according to any of the methods described earlier.

20   *Mobile stations 10_1', 10_2', 10_3', 10_4', 10_5', 10_6'*
     Referring also to Figure 18, the mobile stations 10_1', 10_2', 10_3', 10_4', 10_5', 10_6' are similar to the mobile stations 10_1', 10_2', 10_3', 10_4', 10_5', 10_6' described earlier but also include another antenna 60 and another radio frequency section 61 so allowing them to be used with two types of network. A single antenna may be used for the radio
25   frequency sections 21, 58.

     In this example, the radio frequency section 21 is suitable for modulating/de-modulating and amplifying signals received via the UMTS network 4_B, 6_B and the other radio frequency section 61 is suitable for de-modulating and amplifying signals
30   received via DVB-T network 4_A, 6_A. In other words, in this example the mobile stations 10_1', 10_2', 10_3', 10_4', 10_5', 10_6' are integrated 3G/DVB-T mobile terminals.

DVB-T & UMTS system

Referring to Figure 19, a system for delivering content to and returning feedback
from a receiving station 10_1' is shown. A portion of the system for delivering

5   content to the receiving station 10_1' comprises a broadcast server 2, the Internet 4_A,
a DVB-T system 6_A and a radio transmitter tower 9_A. The broadcast server 2
includes a content provider 1, a service broadcast servers 13, 16, which includes
software for generating IP streams and corresponding IP session announcements at
plural levels, as SAP messages, and a rating server 17. A portion of the system for

10   returning feedback to the ratings device 17 comprises the Internet 4_B, a UMTS
network 6_B and a radio transmitter tower 9_B.

IP streams and IP session announcements 47_1, 47_2, 47_N (Figure 9) generated by the
broadcast server 2 are provided by servers 13, 16, via the Internet 4_A, to the DVB-T

15   system 6_A. Here, the IP streams and IP session announcements are prepared before
being broadcast by the radio transmitter tower 9_A. The receiving station 10_1'
receives session announcements 47_1, 47_2, 47_N (Figure 9) which include an
instruction to transmit a notification 57 (Figure 12) if the receiving station 10_1'
wishes to receive a session 44_1, 44_2 (Figure 7), continue to receive a session or cease

20   to receive a session, in a manner similar to that described earlier.

The receiving station 10_1' transmits a notification 57 (Figure 12) for indicating that
it wishes to consume content, continue receiving content or cease receiving content,
the notification being transmitted through UMTS 6_B and Internet 4_B to ratings

25   server 17, in a manner similar to that described earlier.

It will be appreciated that many modifications may be made to the embodiments
hereinbefore described.

30   For example, the system for delivering content may include more than service
delivery platform, more than one ratings centre, more than one core network and
more than one access network which communicate and share information.

Different transport protocols may be used, such as RTP. The instruction may be transmitted in an application layer, in an IP layer or in a signalling layer.

5   An asynchronous transfer mode (ATM) backbone network and a wireless local area network (WLAN) may be used as core and access networks respectively using an interconnecting edge router.

Internet Group Management Protocol (IGMP) messages may be used to transmit a schedule and include an instruction to notify a given party of consumption of
10 content.

The broadcasting system may be a digital audio broadcasting (DAB) system, an integrated services digital broadcasting (ISDB) system, such as a television ISDB system (ISDB-T), or another DVB system, such as a satellite DVB (DVB-S) system
15 or cable DVB (DVB-C) system.

An integrated GPRS/DVB-T mobile terminal may be used instead of a 3G/DVB-T mobile terminal.

20 The receiver stations need not be mobile, but may be fixed. For example, the receiver station may be integrated into a digital television set or digital television set-top box.

Different receiving stations of different types may be used within the system, for
25 example some receiving stations may be mobile and some may be fixed. Additionally or alternatively, receiving stations may provide feedback through different networks. For example, one receiving station may provide feedback though a 3G network and second receiving station may provide feedback though the Internet via a wired link.

30